

ABSTRACT OF THE DISCLOSURE

An injection pump assembly 10 in a chemical delivery system for simultaneously delivering reagents into a combinatorial reactor system having multiple injectors. The assembly 10 has a plurality of injectors 12, each injector 12 being in fluid communication with one of the multiple reactors. Each injector 12 has (1) a pump 14 in which a plunger 18 sealingly moves to ingest, store and discharge a flushing solvent 20; (2) a pipette assembly 22 for loading, storing, and discharging one or more reagents into one of the reactors in the combinatorial reactor system, first and second reservoirs for retaining some of the reagents; (3) one or more hollow needles 32, each for selectively delivering a reagent 24 to the first 28 or the second 24 reservoir; (4) a first valve 34 positioned downstream of the first 28 reservoir; and (5) a second valve 36 positioned downstream of the second 30 reservoir. When each valve 34, 36 is in a closed position, the reagents 24, 48 can be stored in isolation from each other. When each valve 34, 36 is in an open position, the reagents 24, 48 may flow through the pipette assembly 22. A 3-way valve 38 is positioned between the pump 14 and the pipette assembly 22. An actuator assembly 46 is in operable communication with each of the plurality of injectors so that the 3-way valves 38 of each injector may be repositioned in unison, thereby delivering precise amounts of the flushing solvent 20 and the reagents 24, 48 in varied or consistent amounts to each reactor in the combinatorial reactor system. The inventive method involves operation of the disclosed injection pump assembly.